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ABSTRACT

High schools are increasingly expected to use data for improvement and to provide evidence that programs and instructional practices are preparing all students to develop essential knowledge and skills. This publication describes how schools can develop the capacity to analyze and use data as a core component of improving secondary schools using the Breaking Ranks Model. Seven chapters are as follows: (1) "The Challenges of High School Reform" discusses the expectations for a 21st century high school; (2) "Putting Student Results at the Center of High School Reform" looks at student-centered accountability; (3) "Developing Capacity for Data-Driven High School Reform" considers why high schools resist using data-driven reform; (4) "The Breaking Ranks Model of High School Reform" describes the model's framework and key components; (5) "Data-Driven Reform in Low-Performing High Schools" describes how reform facilitators used data effectively in their work; (6) "The Schools' Experiences in Using Data" gives examples of how high school staff performed data-driven reform; and (7) "Making the Transition to Data-Driven High School Reform: Lessons from Research and Practice" identifies meaningful questions about student performance. Properly used, data can make a difference in meeting the needs of every high school student. (Contains 37 references and 8 figures.) (RT)

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Data-Driven High School Reform

THE BREAKING RANKS MODEL

Mary Ann Lachat

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Data-Driven High School Reform

THE BREAKING RANKS MODEL

Mary Ann Lachat

Northeast and Islands Regional Educational Laboratory
a program of The Education Alliance at Brown University

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Foreword

High schools in the United States must become less like factories and more like learning communities. Few would argue with that statement; however, high school principals and their leadership teams have struggled with various aspects of the needed changes for a number of years. With current educational reform initiatives calling for all students to attain high academic standards, the need for schools to demonstrate progress in achieving this goal is more pressing than ever.

Recently a national emphasis on using data for decision making has solidified and emphasized the need for changes in American high schools and recommendations made in *Breaking Ranks: Changing an American Institution*.

Members of NASSP have asked for substantive information to help them guide their schools and communities in the difficult work of school reform, and works such as this provide real and focused methods for examining data to support reform. Schools can no longer afford to be "successful" with only a portion of their students. The success of all students is the most recent expectation from policymakers, communities, administrators, teachers, and others.

Increasingly, schools are expected to use data for improvement and to provide evidence that programs and instructional practices are preparing all students to develop essential knowledge and skills. *Data-Driven High School Reform: The Breaking Ranks Model* describes how schools can develop the capacity to analyze and use data as a core component of improving secondary schools. It builds on the concepts put forth in *Breaking Ranks: Changing an American Institution* and provides the reader with a context for how data can be used to support a school reform process. It also provides practitioners with concrete examples and useful methods to bring about change in their schools.

Gerald N. Tirozzi, Executive Director
National Association of Secondary School Principals (NASSP)

Introduction

The growing emphasis on educational standards, equity, continuous improvement, and accountability that now drives high school reform is fueled by widespread recognition that schools must become high-performing organizations if they are to prepare all students to succeed in the twenty-first century. Today, our students represent an unprecedented level of diversity—in abilities, learning styles, prior educational experience, attitudes and habits related to learning, language, culture, and home situations. The challenge of educating these students requires new capacities for schools and new orientations for the educators who make decisions that influence students' lives. It requires a commitment to basing these decisions on sound information rather than assumptions and subjective perceptions. The capacity to access and effectively use many types of data from multiple sources is critical to realizing a vision of high school education that embraces the belief of high expectations for all students.

Data-Driven High School Reform: The Breaking Ranks Model was written for all district and school administrators, teachers, staff developers, and public school advocates seeking greater understanding of how to create school cultures that continuously use data to improve student learning and achievement. The process of creating learning environments that support the individual success of each student must incorporate both the willingness and the capacity to continually examine the results of our efforts. This principle of continuous improvement requires the best data available.

This paper is the first in a series that describes ongoing findings from our work in helping low-performing high schools become more student-centered, personalized, and intellectually rigorous through the implementation of the Breaking Ranks Model of High School Reform. The model offers a capacity-building approach to school improvement based on the recommendations of *Breaking Ranks: Changing an American Institution*, which was produced by the National Association of Secondary School Principals (NASSP) in partnership with the Carnegie Foundation for the Advancement of Teaching.

Data-Driven High School Reform presents a synthesis of the research literature on data-driven school improvement, along with illustrative summaries of how the schools with which we are working are using data to support systemic high school reform. This paper highlights the capacities that are essential to data-driven school reform, how we have assisted schools to build these capacities, what we have learned about overcoming barriers to data use, and examples of strategies that promote the use of data for improvement.

I want to express my appreciation to all those who contributed to this paper. For their valuable feedback and comments, I want to thank: John Nori (National Association of Secondary School Principals), Mary Visher (MPR Associates, Inc.), and Stan Thompson (New England Association of Schools and Colleges); Annora Bryant, Office of Educational Research and Improvement, U.S. Department of Education; and Joseph DiMartino and Michael Ferrance at the LAB. I would also like to thank my colleagues at CRM, Martha Williams and Steve Smith, for their contributions and ongoing support. Lastly, I am particularly grateful to Nancy Mullen and Harry Potter for sharing their insights and experiences as principals in the Providence, Rhode Island School District as they seek to create high school cultures that value and use data to improve the quality of learning for all students.

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Dr. Mary Ann Lachat is co-founder and the President of the Center for Resource Management, Inc. (CRM), and has more than 30 years of experience with school reform initiatives at national, state, and local levels. She has directed numerous evaluation studies, and her work has consistently focused on how to build district and school capacity to systematically examine the effects of school improvement initiatives on student learning and achievement. She is the co-designer of the SOCRATES DATA SYSTEM described in this paper and has provided consultation to numerous schools on establishing and sustaining data-driven improvement. She is collaborating with The Education Alliance at Brown University on the development of the Breaking Ranks Model of School Reform. Dr. Lachat also has written on equity issues in school reform and produced two publications for the Northeast and Islands Regional Educational Laboratory at Brown University: *Standards, Equity, and Cultural Diversity* (1999) and *What Policymakers and School Administrators Need to Know About Assessment Reform* (1999).

1 The Challenges of High School Reform

Expectations for a Twenty-first Century High School

The challenges facing American high schools today reflect the multiple dimensions of a twenty-first century society that have created many new demands for high school reform. The past decade has brought an unprecedented commitment to educate all students to be effective thinkers, problem solvers, and communicators who can participate as productive members of a global economy and technological society. New waves of immigration have brought people from all over the world to our nation, resulting in the most ethnically, culturally, and linguistically diverse society this country has ever known. In combination, these conditions and commitments are creating a new mandate for high schools. Never before have schools been asked to ensure that all students achieve publicly defined standards of learning. Never before have we asked schools to consider higher-order skills as core skills to be acquired by all students. Never before have teachers been faced with such diversity (Lachat, 1994, 1999). These challenges call for a transformation of the American high school to match the realities of contemporary life. The call to improve America's high schools isn't new, but the emphasis on high standards for all students is new. This emphasis on high standards for all is intended to raise the ceiling for our most gifted students and lift the floor for those who now experience the least success in school.

> *What is worth fighting for in our schools is ultimately meeting the learning needs of all students and caring for them effectively. While these educational needs are virtually timeless and universal, responding to them effectively in the complex postmodern age creates unique challenges.*
>
> (Hargreaves, 1997, p. 22)

For more than 100 years, our high schools met the workforce needs of an industrial society by organizing learning around a curriculum delivered in standardized time periods called Carnegie Units. Within this structure, curriculum was defined as a set of units, sequences, and facts. Credentials (Carnegie Units) were based on "time served," and the failure of significant numbers of students was not only accepted, but also regarded as an expected result of norm-referenced testing. For the most part, this system of education prepared generations of high school students to find their place in American society. Where it did not, the economy had a place for people who were willing to work hard even if they lacked

basic skills or formal schooling. The opportunities and demands of today's society are different. Conditions of secondary education that allow high school students to leave school without developing essential competencies or ever being challenged to fulfill their potential are no longer acceptable. Educational failure and undeveloped talent are permanent drains on society, and the current reform movement has shifted the emphasis from access for all to high-quality learning for all (Lachat, 1994).

Today's high school students need a very different approach to education as they face the realities and demands of a technological and global society characterized by rapid change and unprecedented diversity. The workplace already demands that individuals understand multidimensional problems, design solutions, plan their own tasks, evaluate results, and work cooperatively with others. These expectations represent a new mission for education that requires high schools to not merely deliver instruction, but to be accountable for ensuring that educational opportunities result in all students learning at high levels (Visher, Emanuel, & Teitelbaum, 1999). However, the research and practice literature provides substantial evidence that the current comprehensive high school model will not succeed in helping all students reach high levels of performance (Brandt, 2000; Cawelti,1994; Visher & Hudis, 1999).

The inadequacy of the American high school is unsettling, especially given that it is a pivotal institution touching the lives of almost every adolescent. The need for comprehensive high school reform is particularly apparent in urban, low-performing high schools where too many students leave school without developing the proficiencies required for success and dropout rates remain unacceptably high. Evidence of poor student performance in these schools is indicative of the fact that too many adolescent students feel disenfranchised, disconnected, and disengaged from learning. This is especially true for students who are at risk due to poverty, cultural differences, or the demands of learning a second language, and lack clear paths to adulthood. Multiple indicators of student failure are thus underscoring the pressing need to restructure low-performing, urban high schools into more engaging and supportive learning communities.

Designed in response to different demographic and economic conditions, too many high school structures are not responsive to today's realities, and they lack the capacities necessary for responding to multiple demands for accountability. The size, structures, and traditional orientations of these schools contribute to student alienation and academic failure. Too many are characterized by large, compartmentalized, and impersonal school settings; low expectations for student performance; and curricula guided by dated and autonomous

departmental priorities. The student's role in the educational process is passive and subordinate. There is a pervasive over emphasis on teacher-directed instruction, and a fragmented curriculum prevents students from seeing the connections between the content learned in school and real life. The vast majority of these high schools find ways to divide students on some measure of ability, which diminishes opportunities to learn for some students and contributes to increasing inequalities among students over time (Marsh & Codding, 1999; Visher et. al., 1999).

Barriers to High School Reform

Many factors act as barriers to systemic high school reform. The need to improve student learning in low-performing high schools is often complicated by inadequate knowledge of how to systemically restructure curriculum and instruction around higher standards of learning and how to provide instruction in settings that engage and motivate diverse learners. Inflexibility in the use of time and space is a barrier to providing the differentiated instruction that ensures equitable access across all student populations to the concepts, understandings, skills, and practices reflected in learning standards (Marsh & Daro, 1999). Over the past 20 years, high schools have not changed their basic structures or relationship patterns to match the characteristics of adolescents in today's world. Technology is not widely used to support instruction, and the majority of students who live in high-poverty communities lack sufficient access to technology both during and after school.

Resistance to change is embedded in strong allegiances to the status quo in such areas as expectations for student performance, curricular goals, course offerings, student and teacher evaluations, and the materials used in classrooms. Contributing to staff resistance are conditions that do not adequately support teacher participation in curriculum and instructional reform. Today's reform efforts require high school teachers to move beyond their customary classroom roles and integrate instruction around real-world tasks that require reasoning, problem solving, and communication skills. This has created great pressure on teachers who work in high schools that lack the essential orientations, structures, and resources for implementing the scope of professional development needed. High schools also lack the information system capacity necessary for strategically using data to identify achievement gaps, address equity issues, determine the effectiveness of specific programs and courses of study, and target instructional improvement (Lachat & Williams, 1996). In addition, information systems in large, urban districts are often inadequate to address high student mobility, thereby inhibiting the efficient movement of information on students who transfer across schools.

The Need for New Strategies and Capacities

There is ample evidence that high schools today cannot afford to be status quo. However, the process of restructuring high schools, particularly low-performing urban high schools, is more difficult, complex, and controversial than the literature on school change has acknowledged. Historically, the literature outlined general processes of school improvement that were supposed to apply to most schools in most places. However, there is growing evidence that these "change rules" are not sufficient remedies for turning low-performing high schools in severe difficulty into high-performing learning communities (Hargreaves, 1997; Myers & Goldstein, 1997). Faced with growing pressure to meet mandates for excellence, equity, and accountability, educational leaders are asking a new set of questions about the requirements of transforming high schools into student-centered learning environments. In order to create high schools that are responsive to diversity, connected to the realities of today's world, and driven by a focus on success for all students, more powerful and systemic change strategies are needed, and new capacities must be developed. One of these capacities is the systematic and strategic use of data to support student success and continuous school improvement (Codding & Rothman, 1999; Bernhardt, 1998).

2 Putting Student Results at the Center of High School Reform

Student-Centered Accountability

The growing urgency in American education to transform low-performing high schools into more responsive learning environments has been paralleled by an emerging body of knowledge that puts student learning at the center of comprehensive high school reform. One of the most comprehensive and visionary frameworks for an effective twenty-first century high school was offered in *Breaking Ranks: Changing an American Institution* (NASSP, 1996). Developed by the National Association of Secondary School Principals (NASSP) in partnership with the Carnegie Foundation for the Advancement of Teaching, *Breaking Ranks* provides a series of recommendations that capture the essential elements of a twenty-first century high school: intellectually rigorous, personalized in programs, responsive to diverse learners, and connected to real-world learning. This vision has been reflected in other frameworks such as the New American High School strategies for high school change (Visher & Hudis, 1999).

At the heart of these new visions of the American high school is a fundamental commitment to student-centered accountability—a commitment that requires a sustained focus on student results. This view is central to the paradigm now driving reform efforts. It makes student learning and continuous improvement the rationale and evaluative criteria for state-, district-, school-, and classroom-level efforts. This emerging concept of schooling is different in several fundamental ways from the paradigm that characterized high schools for more than 100 years. Some of these differences are illustrated in Figure 1.

Given this new paradigm, the central questions shaping reform efforts in low-performing high schools are:

- What specific performance standards should we hold for all students?
- What kinds of learning opportunities will enable a diverse student population to achieve these standards?
- What does it take to transform high schools into places where all students achieve these standards?

Figure 1. Comparison of Traditional and New Paradigms for High Schools

TRADITIONAL SCHOOL PARADIGM	NEW PARADIGM FOR SCHOOLS
■ The "inputs" and process of education are emphasized over results. Curriculum is "covered," and instruction is organized around limited time units prescribed by the school schedule. Schools accept the failure of a significant number of students.	■ The school mission emphasizes high levels of learning for all students. Diverse abilities, developmental levels, readiness, and learning styles are addressed so that all can succeed. There is flexibility in the use of instructional time with an emphasis on learning, not how much content has to be "covered."
■ Learning is organized around a standardized curriculum delivered in standardized time periods. Credentials are awarded based on "time served," issued in "Carnegie Units."	■ Learning is organized around what students should know and be able to do. Credentialing is based on student demonstration of proficiency in these knowledge and skill areas.
■ The curriculum is derived from existing content, which is most often determined by textbooks. The curriculum is organized around a set of units, sequences, concepts, and facts.	■ The curriculum is derived from standards that define what students should know and be able to do. Subject matter is "integrated" around "real-world" tasks that require reasoning, problem solving, and communication.
■ Assessment is done at the end of instruction and is narrowly focused on lower-level and fragmented (end-of-unit) skills that can be assessed through paper-pencil responses. Norm-referenced standardized test results are the basis of accountability.	■ Assessment is integrated with instruction and focuses on what students understand and can do. Methods assess students' competencies through demonstrations, portfolios of work, and other measures. State-based assessments are the basis of external accountability.
■ School accountability is defined in terms of programs offered, attendance and dropout rates, the number of students who are credentialed, and the results of norm-referenced tests. There is minimal systematic monitoring of student progress on an ongoing basis.	■ The school is accountable for demonstrating that all students are developing proficiencies that represent high-level standards for what students should know and be able to do. There is an emphasis on frequent monitoring of student progress.
■ School improvement focuses on: improving the existing organization; adding new programs; changing textbooks; offering teacher workshops; improving school climate; and increasing staff participation in decision making.	■ The emphasis is on systemic reform of school structures, the curriculum, and instructional practices. Collaborative leadership and continuous professional development are emphasized. Improvement is based on sound data about student learning and achievement.

(Lachat & Williams, 1996)

These questions shift the focus away from accountability for providing programs, courses, and instruction, to accountability for producing positive results for all students. It means that as educators, we are responsible for demonstrating the impact of high school policies, programs, course offerings, learning environments, and instructional practices on learner outcomes for all student groups.

The Growing Need for Data

By drawing attention to the central mission of ensuring success for all students, education reform initiatives also have highlighted the need for data to inform the policy, management, and instructional changes that lead to higher achievement. A major emphasis of current reform initiatives is to help schools become genuinely accountable to students, parents, and the broader community. These demands for accountability have been accompanied by growing awareness of the need to provide evidence of a school's effectiveness (Holcomb, 1999). In urban, low-performing high schools, this emphasis has been paralleled by equity concerns arising from the enormous diversity that students represent—in culture, language, prior educational experiences, home situations, learning styles, attitudes toward learning, and future aspirations. This diversity requires a level of individualization that traditional education has never been designed nor equipped to provide. The twin mandates of equity and accountability have made it imperative that educators base decisions on accurate and meaningful data about student learning and achievement.

Student-centered accountability is fundamentally a data-driven process that enables teachers and administrators to look deeply and broadly at the impact of policies and practices on student learning and allows for continuous improvement (Darling-Hammond, Snyder, Ancess, Einbender, Goodwin, & MacDonald, 1993; Lachat & Williams, 1996).

> *"Accountability is achieved only if a school's policies and practices work both to provide an environment that is conducive to learner-based practice and to identify and correct problems as they occur...accountable schools institute practices for feedback and assessment, safeguards to prevent students from 'falling through the cracks,' and incentives to encourage all members of the school community to focus continually on the needs of students and the improvement of practice.*
>
> (L. Darling-Hammond & J. Snyder, 1993)

Student-centered accountability recognizes that what we truly mean by success for all students is success for each student; the school is accountable for ensuring that each and every student is acquiring the knowledge and skills that represent standards for what students should know and be able to do. It focuses on the needs and interests of learners for appropriate and supportive forms of teaching, rather than on the demands of bureaucracies for standardized forms of schooling. It also means that the school is responsible for evaluating the extent to which students, who have particular characteristics or who have had exposure to specific programs and practices, are succeeding. By recognizing that multiple indicators of student performance will not improve unless they are directly addressed, a focus on student results in low-performing high schools means that the entire culture of a school drives toward increasing student success. Putting student learning at the center of school accountability requires the capacity to access and use data to monitor student performance and to evaluate the extent to which new structures and approaches to curriculum, instruction, and assessment result in higher levels of achievement for students. The capacity to use data thus becomes a key element in achieving the goals of school reform.

3 Developing Capacity for Data-Driven High School Reform

The Use of Data as a Stimulus for Change

More than a decade ago, one of the conclusions of the Office of Educational Research and Improvement (OERI) State Accountability Study Group (1988) was that the pursuit of accountability in schools requires better systems for using data to improve low-achieving schools and to encourage high-performing schools. This conclusion has been supported by an emerging body of literature, which underscores that better use of data is essential for improving the quality of learning in high schools (Codding & Rothman, 1999). Bernhardt (1998) made an impassioned case for using data as a lever for creating more effective schools for students and emphasized that "what separates successful schools from those that will not be successful in their school reform efforts is the use of one, often neglected, essential element—data." Other researchers echo this view.

> *Understanding and using data about school and student performance are fundamental to improving schools. Without analyzing and discussing data, schools are unlikely to identify and solve problems that need attention, identify appropriate interventions to solve those problems, or know how they are progressing toward achievement of their goals. Data are the fuel of school reform.*
>
> *...In short, using data separates good schools from mediocre schools. Schools that are increasing student achievement, staff productivity and collegiality, and customer satisfaction use data to inform and guide their decisions and actions. Data use essentially sets a course of action and keeps a staff on that course to school improvement and student success.*
>
> (J. Killian & G. T. Bellamy, 2000)

Ruth Johnson (1996) examined many uses of data to measure equity and made the case that "data offers unlimited potential to districts and schools working to build their capacity to equitably educate students." Holcomb (1999) also talks compellingly about the benefits of data use and emphasizes the importance of mobilizing broad stakeholder involvement and getting people excited—she refers to this as focusing "people, passion, and proof" on strategically aligning all elements of the school around the central mission of maximizing

student success. Holcomb's point is that by analyzing what is and is not working to improve student learning, valuable and scarce resources can be directed toward goals and strategies that make the most impact on achievement. "Time is the most critical resource . . . The time invested in 'data work' can generate a net savings if it guides the school toward decisions that pay dividends in student achievement."

The Regional Alliance for Mathematics and Science Education at TERC has placed a strong emphasis on the use of data and identified the top 10 uses of data as a lever for change. These are shown in Figure 2.

Figure 2. The Regional Alliance's Top 10 Ways to Use Data as a Lever for Change

1. Data can uncover problems that might otherwise remain invisible.
2. Data can convince people of the need for change.
3. Data can confirm or discredit assumptions about students and school practices.
4. Data can get to the root cause of problems, pinpoint areas where change is most needed, and guide resource allocation.
5. Data can help schools evaluate program effectiveness and keep the focus on student learning results.
6. Data can provide the feedback that teachers and administrators need to keep going and stay on course.
7. Data can prevent over-reliance on standardized tests.
8. Data can prevent one-size-fits-all and quick solutions.
9. Data can give schools the ability to respond to accountability questions.
10. Data can build a culture of inquiry and continuous improvement.

(Love, 2000)

A data-driven inquiry process is one of the most effective tools for achieving change in schools often considered furthest from current standards of excellence. In her extensive writings on the critical importance of effective data use in the school reform process, Love (2000) posed the question, "How can classrooms be alive with inquiry if schools are not?"

> *We believe that the same process of inquiry that invigorates classrooms also breathes life into school reform. In inquiry-based schools, teachers and administrators continually ask questions about how to improve student learning, experiment with new ideas, and rigorously use data to uncover problems and monitor results. It's not that these schools have solved all of their problems. It's that they know how to tackle problems and continuously improve. Researchers in both business and education agree that these qualities are hallmarks of successful organizations.*
>
> (Love, 2000)

A study conducted by the North Central Regional Educational Laboratory (NCREL) found that "schools committed to using assessment information to guide their work allocated time for teachers to meet, discuss, and make instructional decisions based on data" (Cromey, 2000). In another study, the Consortium for Policy Research in Education (CPRE) examined the district role in building school capacity for school improvement. One of the most striking trends in nearly all of the 22 districts studied was a growing emphasis on the use of data to drive decisions about practice (Massell, 2000). The philosophy behind data-driven inquiry in school reform efforts is that results for students will not improve unless the results are directly addressed. It grows from a belief that school staff must look at and be guided by the results they produce in their students.

Why High Schools Don't Use Data: Barriers to Effective Data Use

Becoming "data users" requires new capacities for high schools. Although high schools have lots of data, historically they have only provided that data—to the district, to the state, to the federal government—but they haven't used data. This "data provider" role has meant that others defined the criteria of progress upon which the school and its students would be judged (Johnson, 1996). At a time when the need to be data-driven has never been greater, schools tend not to be "data-driven organizations" (NEA, 2000). The result is that few high schools have any type of systematic process in place for examining data on student performance and program results. This means that there is minimal capacity to examine the effectiveness of school reform efforts and the resultant effects on

student learning. Unfortunately, what we have learned from decades of school improvement efforts is that focusing on the process of change without a concurrent focus on results does not lead to any significant impact on student achievement.

> *Site-based innovations mean nothing if a school cannot determine if the efforts have had an effect on students. Most schools move from innovation to innovation and define success as the implementation of the latest innovation. To be blunt, this is nonsense. What difference does any innovation make if a school cannot determine effects on kids?*
>
> (Glickman, 1992)

Many reasons for the lack of data use in high schools center on cultural resistance, fear of reprisal, lack of training, and inadequate information systems.

CULTURAL RESISTANCE

Focusing on student achievement and using data for planning and decision making is a major cultural shift for most high schools. High school cultures simply do not focus on data collection, analysis, or use. The perception of most administrators and teachers is that data are collected for someone else's purposes, and they don't see data analysis as a school priority or as part of their jobs. Beyond the annual ritual of looking at the scores students achieve on mandated state assessments, most schools do not look at how specific programs affect the performance of different groups of students.

> *Too often, schools in this country conduct their education programs with little formal analysis of how well those programs work. Teachers and administrators rely instead on "gut feelings" about what's working and what isn't. They try to be optimistic, hoping that they are doing the right things, but they never get a clear sense of whether their program is working particularly well. Neither do they analyze their goals and challenges systematically, which robs them of the chance to ask better questions and get answers that can lead to meaningful change in classroom practice.*
>
> (Bernhardt, 2000)

This cultural resistance to data use is not just a school phenomenon. From the state education agency to the district and on down to the school and classroom levels, there is a long tradition of data not being used systematically or well. Many state education agencies are starting to emphasize district- and school-level data analysis, yet still are providing only a few incentives "for districts and schools to devote time, money, and staff resources to using data in new ways" (Bernhardt, 2000). At the district level, helping schools gather, analyze, and use data is rarely a priority of central office personnel.

FEAR AND FATALISM

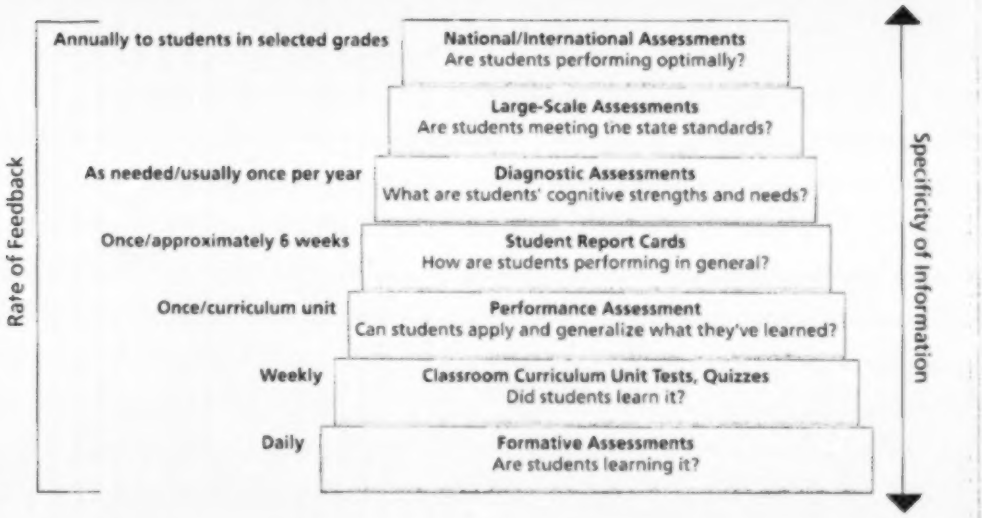
Schmoker (1996) noted that two significant barriers to data use are "fear and fatalism." On the fear dimension, many school staff are afraid that data will be used against the school or specific personnel. With the current emphasis on accountability, test scores are being used increasingly to determine the effectiveness of schools and the competence of administrators and teachers. While this orientation may motivate a high interest in looking at results, it does not create a collegial motivation to examine data in depth to identify problem areas and seek new solutions. The factors that create an "undeniable need for schools and districts to demonstrate the results they achieve for their students and constituents . . . are also perceived as outside threats to educators" (Holcomb, 1999).

The fatalism factor is associated somewhat with the "blame the student" frame of reference. Many high school teachers believe that they have far less influence or control over whether a student learns than factors such as the neighborhood where the student lives, parent attitudes, and student motivation. This perception particularly dominates the belief system in low-performing, urban high schools where teachers' lack of confidence in their power to improve student learning also contributes to an unwillingness to examine what they can do differently to get better student results.

THE COMPLEXITY OF ASSESSMENT DATA

Because assessment is a cornerstone of education reform, it has received extensive attention in recent years and led to new ways of thinking about how student learning should be measured. However, while there is growing agreement that students should be able to demonstrate what they know and are able to do, there is less agreement about the measures that should be used to assess student capabilities. Although most states have made student assessment the focus of school reform efforts, "the density and range of available information contributes to the arduous task of effectively analyzing and applying assessment results to decisions about instruction, the curriculum, or educational programs"

Figure 3. The Richness and Complexity of Student Assessment Data



(Comfrey, 2000). Figure 3, an illustration from an edition of NCREL's POLICY ISSUES (November, 2000), displays the complex array of assessment information available to schools. School staff have difficulty seeing the connections across different types of assessment data and need considerable help in examining how data from various assessments relate to other information that they have about their students.

The considerable attention given to student assessment has not been accompanied by clear guidelines for schools on how to interpret and use a range of assessment measures appropriately to improve student learning. This is further complicated by the evolving state of the art in standards-based test development. The state assessment systems that are the cornerstone of school accountability mandates are being questioned in terms of the extent to which they provide credible and accurate information about student success. Recently, five leading education groups, representing more than 2.7 million teachers, principals, superintendents, education employees, and parents, issued a joint statement calling for higher quality tests (NAESP, 2001) based on a report produced by an independent commission of leading testing experts.

LACK OF SKILLS AND EXPERIENCE

There is an enormous need to develop the skills of high school staff to analyze and use data wisely. Most administrators and teachers do not have formal training in data analysis or in how to apply assessment information to instruction (Cizek, 2000; Wise, Lukin, & Roos, 1991), and "there is little to no pre-service emphasis on the use of data in school improvement processes" (Cromey, 2000). Too few people at the school level have adequate experience in analyzing and interpreting data, and there are very few good models illustrating how data can be used for multiple purposes. People often "glaze over" when presented with a set of data, believing that they need advanced skills in statistical analysis to examine patterns in student performance.

While school staff need a foundation in data analysis, they also need a process that deepens their mutual understanding of how to use data for decision making and supports their use of data for continuous improvement. They need guiding questions that help them examine the data and also the time and opportunities to collaboratively make decisions about what the data mean for their students.

> *Improving schools requires two sets of skills that few school leaders have had the opportunity to acquire in their graduate work or have seen modeled in their own experiences. The first of these is how to involve others in decision making. The second is how to use data in appropriate ways to guide the decision making.*
>
> (Holcomb, 1999)

Love (2000) supports this view and underscores the importance of establishing a collaborative decision-making process that unleashes the full power of inquiry, where school staff work together, where data becomes a catalyst for constructive dialogue, and where "school communities develop shared understandings and ownership of the problems and solutions being pursued" (Love, 2000).

LACK OF ACCESS TO MEANINGFUL DISAGGREGATED DATA

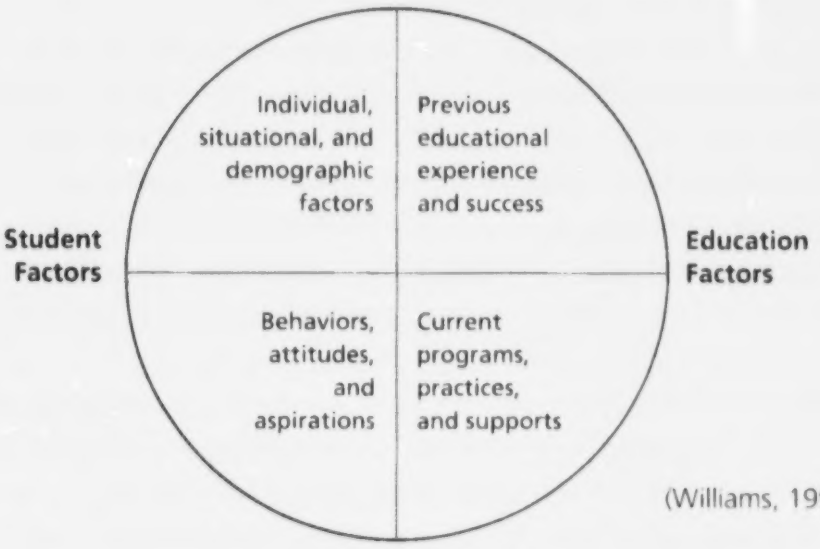
For years, researchers and practitioners have emphasized the limitations of aggregated measures of student outcomes that do not support an understanding of whether specific groups of students are benefiting from their educational experiences (Levine & Lezotte, 1990). Leaders in school reform efforts are very clear about one key aspect of effective data use—Disaggregate! Disaggregate! Disaggregate! (Bernhardt, 1998; Holcomb, 1999;

Johnson, 1996; Love, 2000). Disaggregation allows a school to determine how various subgroups are performing, and as Lezotte and Jacoby (1992) pointed out, "it is not a problem-solving process, but a problem-finding process." Given the fact that the emphasis on accountability has also escalated a defensive tendency on the part of school staff to "blame the victim," disaggregated data can be an important tool for understanding the patterns of success or failure in a school population and, as expressed by Holcomb (1999), for "separating the *whys* from the *whines*." Less has been written about the fact that meaningful disaggregation also requires the capability to integrate data—the ability to link multiple types of student performance data, student demographic data, and data on students' educational experiences (Lachat & Williams, 1996).

Even in districts and schools where extensive data is maintained, there is limited capacity to integrate and manipulate multiple types of data in meaningful ways. Part of the problem is that data are not in formats that allow school staff to use the information to systematically examine school and classroom practices against results for students (Lachat & Williams, in press). Data exist in different electronic and print files that include district and school student information systems as well as data files from state assessments and other testing programs. Because of this, teachers and administrators do not have easy access to the data that they need in order to examine the performance of specific groups of students and the effects of programs and practices on student performance over time. The student information systems most commonly used by schools were not designed to function as accountability systems. They create schedules, generate report cards, produce school- and grade-level attendance reports, and, in some cases, grade distributions for specific courses. They were not designed to disaggregate performance data or to correlate performance data with demographic data or data on students' educational experiences. Schools, therefore, cannot disaggregate data or link multiple types of student performance data to specific programs, practices, and policies.

These factors have made the ongoing analysis and use of comprehensive data on student performance difficult for most high schools. "When it comes to using data to address problems, target improvements, or monitor progress, schools are ill-equipped. They lack good data-management systems along with the will, skill, time, and organizational structures to use data effectively" (Love, 2000). Most high schools struggle to produce data to answer the most basic questions about the performance of specific groups of students. Visher and Hudis (1999) reported that high schools participating in the New American High Schools initiative vary considerably in how they perceive and use assessment data and

Figure 4. Factors That Affect the Performance of Students



highlighted that as schools use more varied assessment measures to make decisions about student progress, a data system must be able to accommodate these data. In short, linking student results to specific programs, classroom practices, and learning environments requires information system capacity that very few high schools have.

Creating Information System Capacity for Data-Driven Reform

For more than 20 years, research and development activities conducted by the Center for Resource Management, Inc. (CRM), a partner organization of the Northeast and Islands Regional Laboratory at Brown University (LAB), have addressed the issue of how to build information system capacity in districts and schools that: (1) produces the data necessary to support systemic change and (2) focuses continuous improvement on student learning and achievement. The research has been drawn from CRM's role in directing and evaluating school reform initiatives and has highlighted several information system requirements that are essential to supporting a central focus on student results.

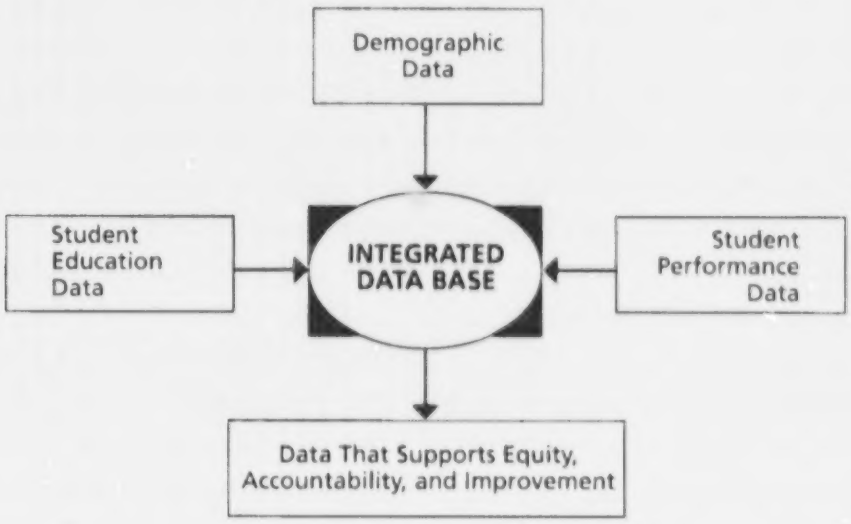
INTEGRATING AND DISAGGREGATING DATA: THE SOCRATES DATA SYSTEM

Data capacity means being able to integrate, disaggregate, and use data for decision making. Developing this capacity starts with the recognition that many factors influence student performance: demographic and individual student factors; the students' knowledge and skills; the students' behaviors and attitudes toward learning and future aspirations; the students' previous educational experiences and success; and the quality and depth of current educational opportunities and supports provided to students.

To develop deeper understandings of student needs and progress, as well as program and instructional effectiveness, school staff need to be able to sort data by these factors. Data-driven high school reform requires the capacity to link student results to instructional practices and to disaggregate data so that results can be examined in meaningful ways. It means being able to obtain information about the performance of students with particular characteristics, the programs and practices to which they are exposed, and the knowledge and skills that they have acquired. Student results have to be examined in the context of educational practice and the quality of opportunities that schools provide for students, but the question of why student results appear as they do must be addressed. Bernhardt (2000) refers to this as "crossing" different measures or the "intersection" of different data. Although one set of data may supply useful information, it is linking different types of data that yields much deeper insights. "Test scores alone won't tell you who your students are, what qualities are shared by the ones doing well, and why others are not successful" (Bernhardt, 2000).

In short, a core element of the information system capacity that supports comprehensive school reform involves linking information about student performance to information about the characteristics of students and their educational programs. This means having an integrated, fully relational database that brings together pertinent information related to three core sets of data, as shown in Figure 5.

Figure 5. An Integrated Database



The integrated database includes the following data elements:

Demographic Data: gender; ethnicity; economic status; disability; language proficiency; aspirations and attitudes; and other data on student characteristics.

Student Education Data: current school; grade level; sending school; years in district; prior education programs; prior retention; current programs, courses, and levels; special programs; learning community/academy or other structures for learning; learning opportunities such as internships and connections to college/career options; and participation in school activities.

Student Performance Data: attendance; discipline; diagnostic assessments; classroom assessments/grades; proficiency assessments; state assessment results; standardized test results; dropout rates; and graduation rates.

Having the capacity to integrate and create intersections within and across the above data categories allows school staff to

1. determine the extent to which students with specific characteristics are achieving success across multiple performance indicators over time,
2. examine the factors that affect student performance, and
3. determine the extent to which specific programs and practices result in student success.

The system capacity to provide this level of information becomes an important vehicle for helping high school teams develop shared understandings (a common language) about student performance trends and shared commitments to improve the instructional opportunities and supports provided to students.

KEY FEATURES OF A DATA SYSTEM

In addition to the technical information system requirements of data integration and disaggregation, CRM's research also acquired input from practitioners and stakeholders from more than 250 schools about what they wanted in a data system (Lachat, 1994). Important features included the ability to

- Integrate multiple types of assessment and performance data;
- Import data from school information systems to avoid redundant data entry;
- Be sufficiently flexible to address individual school characteristics, priorities, and diverse information needs;
- Show the relationships among multiple student characteristics, multiple educational factors, and multiple performance measures;
- Present data in formats that relate to the questions posed by teachers and administrators and that lend themselves to analysis and decision making;
- Help schools evaluate specific programs;
- Allow for longitudinal analyses on specific student cohorts;
- Enable schools to communicate results to pertinent constituencies.

These data system features represent important capacities for high schools seeking to create more positive and personalized environments for their students. They also reflect key elements for bringing high schools into the information age and for empowering school staff with information that directly relates to their mission of ensuring higher levels of learning for all students.

To help schools acquire this capacity, CRM developed a data system that was designed to make the complex possible and to support ongoing data-driven planning and program improvement. The system has powerful import and data merge capabilities, and it brings together data from district and school information systems, state assessments, testing programs, and other data files to create a fully integrated, relational database that allows virtually unlimited disaggregation. The system generates user-friendly data profiles that allow district and school practitioners to easily see relationships across multiple types of data and to analyze patterns and trends. Partial funding for developing the SOCRATES DATA SYSTEM[1] was provided through the U.S. Department of Education's Small Business Innovation Research (SBIR) Program, which funds the development of innovative applications that enhance the capacity of schools and districts.

The SOCRATES DATA SYSTEM is being used in several research studies conducted under the LAB's Student-Centered Learning program. The system is helping to determine changes in student learning and achievement resulting from the implementation of varied strategies for transforming low-performing schools into high-performing learning communities. In particular, the system is being used to support data-driven high school reform in a cluster of low-performing, urban high schools that are implementing the Breaking Ranks Model of High School Reform.

[1] For information about the SOCRATES DATA SYSTEM, contact the Center for Resource Management, Inc., 2 Highland Road, S. Hampton, NH 03827, 603.394.7040, http://www.crminc.com/socrates

4 The Breaking Ranks Model of High School Reform

The Breaking Ranks Framework for School Change

The series of recommendations offered in *Breaking Ranks: Changing an American Institution* (NASSP, 1996) provides a powerful and challenging vision of the twenty-first century high school and is widely viewed as a guiding force for high school improvement throughout the nation. The overarching and paramount theme of *Breaking Ranks* is that the high school of the twenty-first century must be more student centered, intellectually rigorous, and personalized in programs and support services. Such high schools will be learning communities that reflect cultures of respect and trust among staff and students, where the spirit of teaching and learning is driven by high standards of learning for all students. *Breaking Ranks* was developed by the National Association of Secondary School Principals (NASSP) in partnership with the Carnegie Foundation for the Advancement of Teaching. Through this collaboration, NASSP contributed theory and practice knowledge from its rich research base and from the 80 years of experience of its thousands of members. Carnegie brought to the table a rich array of scholarly research on student-teacher relationships and the process of learning and applying knowledge.

The *Breaking Ranks* recommendations provide a framework that helps secondary educators see the congruency and relationships among multiple aspects of school reform. They serve as guidelines for restructuring high schools in ways that engage students, ensure their access to high-quality learning, and prepare them for lifelong success. They reflect the belief that "the central aspects of teaching and learning must provide the focus for high school reform," and the change process must demonstrate a concern for achieving high academic standards. The most important elements of the Breaking Ranks high school are: high expectations for all students; a curriculum organized around essential learning and connected to real-world tasks; personalization in the learning process; flexibility in time for instruction; use of technology to support teaching and learning; continuous professional development; collaborative leadership; and partnerships to support postsecondary success (NASSP, 1996). The school reform themes emphasized in *Breaking Ranks* are also reflected in the U.S. Department of Education's New American High Schools initiative, which is implementing a set of school reform strategies in a few carefully selected high schools.

In the northeast region, the accreditation process has a major influence on the life of secondary schools. Through a partnership established between the Northeast and Islands Laboratory at Brown University (LAB) and the Commission of Public Secondary Schools of the New England Association of Schools and Colleges (NEASC), the regional accreditation process was revised to focus on standards and to more explicitly support the quality of instruction and learning environments that result in improved student learning. This project resulted in a self-study process for high schools with supporting materials (NEASC, 1999). In addition, the LAB did an analysis of the similarities among the new NEASC Standards and Indicators for Accreditation, the *Breaking Ranks* recommendations, and the key reform strategies associated with the New American High School initiative. The analysis showed a remarkable congruency among these three frameworks for school improvement (DiMartino, 1999).

Although *Breaking Ranks* offers a comprehensive set of recommendations based on the best thinking available, further research and development was needed to transform these recommendations into a secondary reform model that would incorporate the strategies, tools, and resource materials required to implement and sustain a reform process. The LAB recognized the potential of *Breaking Ranks* as a vehicle for guiding high school reform in low-performing schools in the northeast region. In collaboration with NASSP, the Center for Resource Management, Inc. (CRM), the Massachusetts Association of Secondary School Principals, and four Massachusetts high schools, the LAB developed and piloted the Breaking Ranks Model of High School Reform,[2] a systemic, data-based model to support school implementation of the *Breaking Ranks* recommendations. In addition to the Massachusetts pilot sites, the LAB is currently conducting a study in six, urban, low-performing high schools on how the implementation of the *Breaking Ranks* framework supports effective high school reform and improved teaching and learning. Through this study, the conditions and strategies necessary for achieving and sustaining positive change and improvement are being documented, and resultant effects on student learning and achievement for diverse student populations will be determined.

[2] For information about the Breaking Ranks Model of High School Reform, contact The Education Alliance, 222 Richmond Street, Suite 300, Providence, RI 02903, 401.274.9548, http://www.lab.brown.edu

Key Components of the Breaking Ranks Model

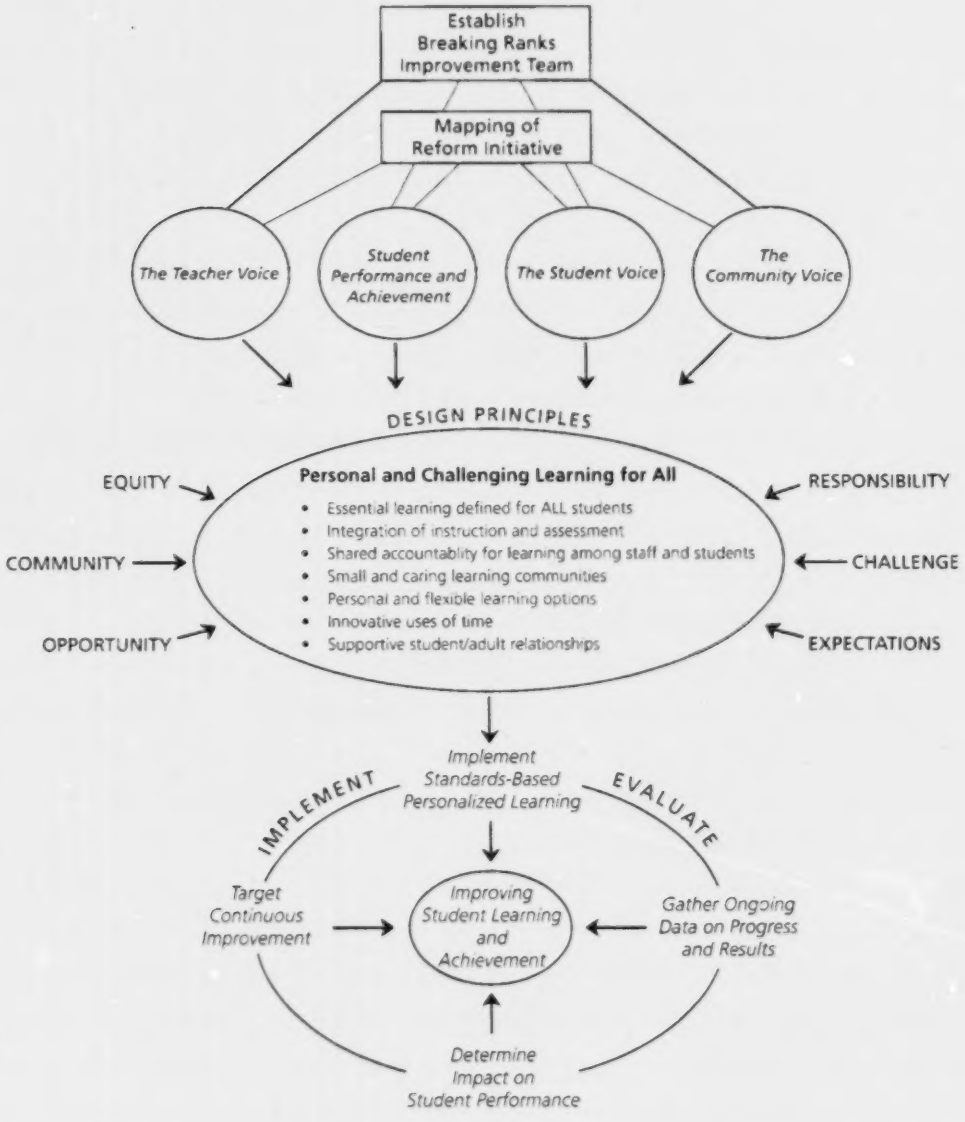
The overall goal of the Breaking Ranks Model of High School Reform is to help high schools improve learning opportunities and achievement results for all students. The model has been designed to assist high schools in achieving the following objectives:

1. Ensure that all students have access to rigorous, standards-based, real-world instruction
2. Restructure the high school into small, personalized learning communities
3. Develop staff capacity to systematically use data for purposes of equity, accountability, and instructional improvement
4. Implement collaborative leadership strategies that engage staff, students, parents, and the broader community in supporting school and student success

The Breaking Ranks Model of High School Reform was specifically designed to help high schools implement the *Breaking Ranks* recommendations and overcome many of the barriers to comprehensive reform. The model includes: structured processes; technology support; a broad array of resources and materials; and training and facilitation assistance, all of which is targeted to transforming core aspects of a high school that impact on student learning and achievement. These aspects include expectations, curriculum, instruction, assessment, the learning environment, and support systems for students. The design principles and key elements of the model are illustrated in Figure 6.

The Breaking Ranks Model employs collaborative leadership strategies that systematically engage a school design team in planning and implementing an improvement process that places student learning at the center of high school restructuring. The school design team serves as a core group for planning and organizing the improvement process and ensuring school-wide communication and participation. The team includes teachers and administrators, student and parent representatives, community representatives, and other designated constituents. Breaking Ranks facilitators assist the design team to establish a systematic process that supports all phases of the school transformation initiative.

Figure 6. The Breaking Ranks Model for High School Reform



The Breaking Ranks Model was developed by the National Association of Secondary School Principals (NASSP), The Education Alliance at Brown University, and the Center for Resource Management, Inc. (CRM).

Through one component of the model, high school staff participate in a curriculum restructuring process that focuses instruction around high standards for learning. The process models and reinforces the belief that *all* staff share responsibility for ensuring that *all* students have access to high learning standards. This process supports high school efforts to align curricula with learning standards and helps staff achieve consensus about their collective and individual responsibilities for engaging students in challenging learning opportunities tied to real-world tasks. High schools also receive planning and consultation assistance focused on creating smaller and more personal learning communities that effectively engage students and accommodate different learning styles. Technical assistance resources and consultation are provided on how to implement a variety of strategies that enhance learning and student success such as flexible scheduling, reducing teacher loads, and creating teacher advisories and adult advocates to personalize and support student learning.

The ongoing implementation of the Breaking Ranks Model is supported by a process that builds school capacity to use data for ongoing improvement. The process reflects the core vision that the "high school is, above all else, a learning community, and each school must commit itself to expecting demonstrated academic achievement for every student in accord with standards that can stand up to national scrutiny." This vision requires not only the capacity to restructure schools based on higher standards of student performance but also the capacity to access and use data in ways that support ongoing improvement. Many models of school reform have lacked the capacity to acquire ongoing student performance data that allow school staff to systematically examine changes over time on multiple indicators. The use of the SOCRATES DATA SYSTEM as an integral component of the Breaking Ranks process thus represents a unique aspect of this model for school reform. Not only does it provide participating schools with state-of-the-art information system capacity to address issues of equity and program effectiveness as they progress through a school reform process, but it also serves as a powerful evaluation tool in documenting changes in student performance over time.

5 Data-Driven Reform in Low-Performing High Schools

This section describes how facilitators worked with eight, low-performing high schools during their first year of implementing a systemic, data-driven reform process based on the Breaking Ranks Model. The progress and experiences of these schools offer rich information on how school staff use data for school improvement and build capacity for data-driven reform. The high schools are located in three, high-poverty, urban districts with ethnically diverse student populations. In all of the districts, the majority of high school students were achieving at the lowest levels of the state's standards-based assessments and other standardized measures in English language arts and mathematics. Student literacy was a major issue in these districts, and school staff were interested in disaggregating and using data to inform specific plans for improvement in each of the high schools.

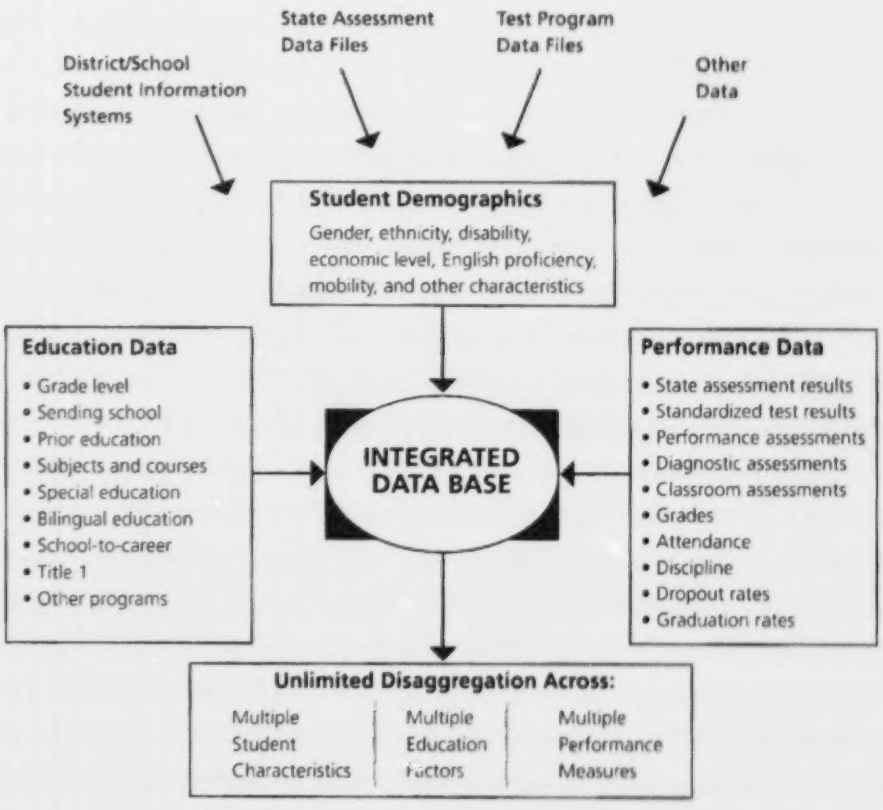
The process of building the capacity to use data effectively in the high schools addressed several key areas: data integration and disaggregation, providing data displays in useful formats, technical assistance in analyzing the data, and facilitating collaborative inquiry around the use of data for planning and improvement.

Integrate! Disaggregate! The Breaking Ranks High School Database

Each of the high schools used the SOCRATES DATA SYSTEM to create a fully integrated database of student information from a variety of sources to support the work of the school leadership teams. Data confidentiality agreements were established with each district site in line with Family Educational Rights and Privacy Act (FERPA) regulations, and a Breaking Ranks facilitator from CRM worked with district and school staff to identify the data that would be included in the database as well as data access procedures. The information that was imported into SOCRATES included: (1) electronic data files from the school or district student information system, which provided demographic, absence, withdrawal and course grade data, as well as data on student participation in special education, bilingual education, ESL, and career education programs; and (2) data files from the state assessment program and other testing programs administered to the high school student population. Pertinent data not yet available electronically, such as student membership in a learning academy and participation in specific programs, projects, or internships, were entered manually into the SOCRATES system. SOCRATES also allows student survey data, such as attitudes about school and post secondary aspirations, to be entered into the database. The SOCRATES database is updated on a regular schedule for each school.

The fully integrated database allowed the school design teams to link a wide range of data about student performance, student demographics, and students' educational experiences, which had previously been in separate data files. Because it provides virtually unlimited capability to disaggregate data, the database became an important vehicle for helping the teams define questions and develop shared understandings (a common language) about student performance trends. SOCRATES provided data that addresses the student performance issues being examined by the school teams. As they worked together, the teams were able to raise deeper questions about how specific groups of students were performing because the data reports displayed "many-to-many" relationships where data could be disaggregated across multiple student characteristics, education factors, and measures.

Figure 7. Breaking Ranks High School Database



Bernhardt (2000) refers to this capability as three-way and four-way data intersections that allow school staff "to pose and answer questions that will predict if their actions, processes, and programs will meet students' needs." The scope of data disaggregation made available to the Breaking Ranks high schools is illustrated in Figure 7.

The major goal of the data component of the Breaking Ranks Model is to provide schools with extensive capacity to access and use meaningful data that enhance planning and program improvement. The scope of data disaggregation available to Breaking Ranks high schools is extensive, as described below.

Breaking Ranks High Schools are able to

- Track the performance of specific student groups on multiple measures, including students participating in specific programs and students in learning academies/communities, courses, projects, or internships;
- Profile performance by gender, race/ethnicity, economic level, language proficiency, disability, and other equity factors to identify achievement gaps;
- Analyze student performance at multiple levels, including school, grade level, academy/learning community, subject area, program, course, classroom, and individual student;
- Compare student course grades to results on state assessments and other standardized measures;
- Determine how factors such as absence and mobility affect assessment results;
- Analyze trends in absence, suspension, and dropout rates for specific student groups;
- Profile longitudinal performance trends on multiple measures;
- Track the longitudinal performance of specific student cohorts;
- Make data-informed decisions about instructional improvement.

Data Access, Technical Assistance, and Collaborative Inquiry

Assistance to the schools involves producing data packages that facilitate the use of data for planning and program improvement. The data packages include SOCRATES data profiles, related tables, and graphic displays, which allow the school teams to easily see relationships across multiple types of data and to analyze patterns and trends. Baseline and ongoing data profiles on multiple indicators of student performance for various student groups are shared and reviewed with the teams, and a facilitator works with them to develop staff skills in data analysis and data-based decision making.

The process of working with the school design teams reflects an underlying belief that generating data by itself will not drive high school reform. The data need to be looked at through a collaborative process involving open discussion and analysis, providing the school teams with the time and the opportunity to look at data as a group and have a constructive dialogue. This approach mirrors the following observation made by Love (2000) in her comprehensive review of how data can be used for collaborative inquiry in school-based mathematics and science reform.

> *"Data don't change schools, people do—people who are committed to working together and doing whatever it takes to improve learning. But they need to be armed with good data if they are going to uncover and understand problems, test the best solutions, and learn as they go. Data use and inquiry are inseparable companions on the road to reform and hallmarks of the most successful schools.*
>
> (Love, 2000)

A primary role of the facilitator is to promote collaborative inquiry around the use of data for planning and improvement. The facilitator provides an initial set of guiding questions as a catalyst for helping the teams learn how to examine the data to identify problems as well as areas of success, and the school teams add to the questions and make additional data requests.

6 The Schools' Experiences in Using Data

In all of the high school sites, facilitators documented the initial phase of the Breaking Ranks school reform process with meeting summaries and quarterly and annual summary reports. In addition, a senior research associate for the LAB study conducted end-of-year interviews with the high school principals and other school design team members. The meeting summaries, report formats, and interview protocols were structured similarly to capture qualitative data on the methods and effects of the high school reform process, including uses of data. Key issues focused on how the school teams used data to address specific issues, what they learned from using the data, and changes in staff attitudes toward data. This section describes what the Breaking Ranks team has learned from the schools' experiences based on their first year of implementing a systemic, data-driven reform process.

First-Year Progress in Building the Capacity to Use Data

At all of the school sites, after just one year of implementing a systemic, data-driven reform process, there was visible progress in establishing a higher level of data capacity for each school and in staff willingness and ability to analyze and use data. Several patterns emerged across the schools in areas related to reducing cultural resistance to data use, ensuring timely access to data, and increasing the confidence and skills of staff to use data for planning and improvement.

1. REDUCING CULTURAL RESISTANCE TO DATA USE

From a data use perspective, the school teams went through an important transition in their attitudes toward data. In the past, the schools had received reports showing annual state assessment results as well as results on other standardized measures. Beyond examining aggregate results for the school, much of which also had been published in the local newspapers, the principals and school staff had not worked together to examine the data in depth, nor was there any assigned group in any of the schools to do this. Also, without the capability for further disaggregation, school staff were not able to examine how specific groups of students performed.

Disaggregating and presenting data in ways that addressed the questions and concerns raised by the school design teams was a major catalyst in changing how the team viewed data. The data held more value and meaning for the team members, and several individuals who initially demonstrated little interest in spending time on reviewing data became active data users. An important realization was that the data could address their issues, allow them to examine assumptions, and support their process of planning and inquiry. In short, school teams started to see data as a tool rather than a burden.

2. ENSURING ONGOING ACCESS TO DATA

A major emphasis of the first-year initiative was to develop and implement a Data Access Plan with the technical personnel who maintain the district student information system. Facilitators learned how essential it was that these staff became a part of the team, because they were responsible for providing the data files imported into the SOCRATES DATA SYSTEM. A consistent finding across the schools was that it was critical for these individuals to understand: (1) why the data were being accessed; (2) that data confidentiality assurances had been provided; (3) how the SOCRATES DATA SYSTEM differed from the district/school information system; and (4) the expanded information system capability that SOCRATES provided. In the past, technical staff had often been burdened with data requests from various projects without being informed of the intent of the data use. In some cases, they also saw data system functions as "their turf," and, in most cases, they saw their role as maintaining the district information system rather than providing useful data to the schools. Thus, the major finding was that a data-driven school reform process such as Breaking Ranks needs to invest time in helping schools establish more effective relationships with the people who control data in a district. This is essential to ensuring the efficient transfer of data and to helping schools move beyond their role as "data providers" toward the role of "data users."

By the end of the first year, a Data Access Plan was collaboratively developed by CRM staff and appropriate technical staff. The plan included a schedule for importing various data files into SOCRATES and ensured that the school teams would receive pertinent data on a timely basis. This meant that the school administrators and teachers could be confident they would have access to an ongoing series of data reports that would allow them to examine their progress in improving multiple indicators of student performance. Another major accomplishment was identifying specific cohorts of students for whom longitudinal data would be created, starting from the middle school years. This would allow for more meaningful analyses of changes in the achievement of these students as they progressed through high school.

3. INCREASING STAFF CONFIDENCE AND SKILLS TO USE DATA

A key factor in building the confidence and skills of the school teams to analyze and apply data was the use of guiding questions. The questions focused on various aspects of student performance and reflected concerns that had been identified in the school's Education Improvement Plan and by members of the school design team. The types of questions explored by the school teams are shown in Figure 8. As the questions suggest, the teams explored a range of issues: the performance and progress of specific groups of students; how students, enrolled in specific programs, learning academies, and courses of study, performed on various assessments; the relationships between the grades that students received and their performance on external assessments; and the effects of school attendance on student performance. This data-driven inquiry approach helped the teams maintain a consistent focus on student achievement and how the high school program needed to improve. People who initially felt that they did not know how to analyze or interpret data became more confident in looking at patterns of student performance. They more actively expressed their opinions about what the data indicated for school improvement. Over the course of a year, examining the data through this process of ongoing inquiry allowed the school teams to look more deeply and broadly into the school policies, beliefs, conditions, and practices that influenced student success. They began to target areas for school and program improvement based on student performance data and incorporated these priorities into the school's Education Improvement Plan and the school restructuring process.

Figure 8. Questions Addressed by the Breaking Ranks High School Teams

- What are the student enrollment patterns at different grade levels? What is the attrition rate between the 9th and 12th grades? What types of students are dropping out?
- What are the characteristics of students with high absence rates?
- How are specific groups of students performing on state and standardized assessments?
- How are students, who are enrolled in different learning academies, specific course offerings, and special programs, performing?
- How does absence affect student performance? Are students with high attendance rates achieving success?
- What are the proficiency levels of various student groups in content and skill areas? Are there knowledge and skill areas where there are notable achievement gaps by gender or race/ethnicity?
- How do the grades given to students compare to their scores on state assessments and other standardized measures?
- Do grading patterns suggest inconsistencies in grading criteria across learning academies, subject areas, or course offerings?
- Are students who are enrolled in specific programs achieving positive results on different measures?
- Are specific groups of students enrolling in higher level courses? What is the failure rate of students by gender and by ethnicity in core courses?
- What are the characteristics and literacy skills of the incoming ninth-grade class? What does this tell us about their instructional needs?

Voices From the Field: Illustrations of Data Use by High School Staff

The following examples of data use in the high schools are all based on the first year of implementing the Breaking Ranks Model and the first year of building capacity in these schools to use data effectively. The illustrations demonstrate the power of data capacity when it occurs in a context where the collaborative review and analysis of the data is fostered.

OVERCOMING FALSE ASSUMPTIONS

As one principal indicated, when the school team analyzed the data together as a group, some popular beliefs were negated, particularly the belief that the students who were doing poorly were the students with high absence rates. Examples of how false assumptions were addressed in three of the schools are illustrated below.

In one school, the team spent a lot of time analyzing the information provided by SOCRATES and discovered some misconceptions they had about student performance at the school. The team had noticed that about 30% of the students were absent more than 40 days and about 30% of students were failing at least one core course. The team's initial assumption was that the students with low attendance were the ones that were failing. However, when the data were further disaggregated to correlate school attendance with course grades, the team learned that roughly half the students who were failing were attending school regularly and about half the students who were absent more than 40 days were passing, some of them with B's and C's. As expressed by the principal, "This created a philosophical and moral dilemma" for the staff. Previously, poor performance was thought to be positively related to poor attendance, but after looking at the data, the team concluded that "half of the students who were in school every day did very poorly." The data made the staff face the fact that there must be other causes for students' poor performance.

Another school team also examined the assumption that low student achievement resulted from high student absence. Their focus on this issue partly reflected a district-wide mandate to improve student achievement and the quality of instruction provided to high school students. School staff assumed that the students with high attendance were doing well and the students with high absence were not doing well on multiple measures including the standards-based state assessment, another standardized measure, and course grades. Through the use of SOCRATES, performance results on these multiple measures were disaggregated by frequency of student absence. The data showed that while students with high absence rates were certainly performing at failing levels, the same was true for the majority of students with the highest attendance rates. The data confirmed that the school had two problems—attendance and quality of instruction. Reviewing the data and eliminating the assumption that the problem was only an attendance issue allowed more productive discussions on the content and quality of instruction provided to students, teacher expectations for students, and the need to create smaller learning communities that would engage students more effectively.

In one high school, disaggregated student achievement data on the state assessment results and other standardized assessments given by the district acted as a catalyst for staff discussion and introspection about the instruction provided to students. The principal and several teachers believed that although several students struggled academically, classroom instruction, particularly in mathematical problem solving, was strong. The student achievement data conflicted with that belief, and the principal and teachers were compelled by the data to question their assumptions. This led to more reflective discussions by the school redesign team about what good mathematical instruction looks like, particularly in the area of mathematical reasoning and problem solving.

SUPPORTING STAFF BELIEFS ABOUT SMALL LEARNING COMMUNITIES

In schools that had begun the process of restructuring into smaller learning communities or academies, the school design teams were particularly interested in looking at data about the progress of students in these settings. They used the data to plan improvement.

About one third of the students in one of the high schools had been assigned to small learning academies. Most of the school staff felt that students in the academies would do better and the data supported that belief. The use of the data reinforced staff beliefs that the academy system would produce positive results for students and helped dispel the doubts of other staff. While some academies did better than expected and others not as well as expected, overall, the students in the academies performed better than the students who were not, based on measures related to attendance and performance on the state assessment. The school design team's analysis of the data led to discussions about the instructional approaches used in the different academies. This led them to modify the instruction that was occurring in certain academies.

The use of data in another Breaking Ranks high school also confirmed and supported the school's strategic plan to divide the school into four small learning communities. The school already had established one small learning community (the Essential School) within the school. The data showed that the students in this learning community had far better attendance, and the principal indicated that "even though their scores, while higher, were not high enough, the indicators were powerful." Another member of the school team expressed that "it was powerful to have evidence that supported what we thought." For the first time, the team could compare the state assessment results (based on standards) for students who were not in the learning community to the results of those who were. While most students in both settings did not meet the proficiency standards for English language arts and mathematics, the learning community students performed better. "So we were able to say in some regards that there are good things in that program (Essential School) that we can benefit from, but we need to do a lot more around targeted areas in writing, math, and reading." The principal stated, "I was able to use that data to have a conversation with the faculty, specifically department heads and staff in the Essential School, about what the data meant for us."

EXAMINING EQUITY ISSUES

Data disaggregation allowed the high school teams to examine equity issues about the performance of specific groups of students. The following examples illustrate some of the collaborative discussions that occurred when the Breaking Ranks school design teams were provided with data focused on their questions about equity.

- An issue that became a point of serious discussion in one of the schools was student participation in higher level courses. When school staff were provided with disaggregated data on student enrollment in advanced course offerings by gender and race/ethnicity, it became almost impossible for them to ignore the fact that very few students in the school were taking these courses. More seriously, the school didn't even offer advanced level mathematics courses— a fact school staff had accepted for years. The general message this conveyed was that expectations were so low for the students in this high-poverty school that higher level mathematics instruction wasn't even considered as an option for students. Looking at the data led to further discussions connecting to the component of the Breaking Ranks model that offers schools a structured process for aligning course content with state standards. School staff had the opportunity to work together to restructure the school's core course offerings according to a standards-based sequence involving higher level concepts and skills for all students. They also started the planning process for creating ninth-grade learning academies that will provide more support to students, as well as offer a transition process for staff to move away from the previous departmental curriculum.

- The disaggregated student achievement data provided an avenue for the high school principal and other members of the school design team to openly raise their concerns about equity and fairness for students in the school. The process of reviewing the data created an opportunity for people to move beyond their assumptions and their opinions about individual students toward a focus on what was happening in the school as a whole. They specifically discussed how certain groups of students were treated in the school and the implications of that treatment (good or bad). This brought them to a discussion of what needed to happen in the school to ensure that all students were treated fairly and with respect.

One school design team had three African American male students as members. They worked well with the teachers on the team and openly expressed their insights about the meaning of the data. In one instance, the students noticed from a graph of student performance on a reading assessment by ethnicity that the "blacks" and "Hispanics" performed much worse than the "Asian" and "white" populations. The students were sophisticated enough to recognize the difference in population size among these groups, but they still expressed their thoughts about factors in the school that could account for these differences. One student observed that "my (black) friends do the minimum required to pass . . . the Asians are pretty competitive." When asked by a teacher why he had turned his academic performance around during the school year, the student commented that his mother "got on my case." What was noteworthy in this example was that the African American students did not feel that they or their friends could not succeed in school, but that it was a matter of effort, and sometimes the intervention of an adult made the difference. Their participation on the school design team allowed the "student voice" to play a part in discussions that explored why certain groups of students were performing better than others and what factors motivate better performance.

LOOKING AT GRADING CRITERIA

An area of concern to the school design teams in most of the Breaking Ranks high schools was the relationship between students' grades and their test performance on state assessments and other standardized measures. The basic question was how students who were given high grades in English and mathematics courses performed on the tests.

- In one district, all of the Breaking Ranks high schools were provided with SOCRATES data profiles that allowed them to examine how students who received various grades in specific high school courses performed on the Grade 10 state assessments and the Grade 9 and 11 Stanford 9 assessments. When staff analyzed the data, they found in many cases that students who had received high grades performed at the lowest levels of the state assessments and the Stanford 9 tests.

- Many important issues were raised when school staff reviewed these data. A fundamental question was what a grade of "A" or "B" really means. This usually started a process of inquiry about what criteria teachers used to give grades; whether teachers in specific subject areas agreed about the criteria for the grades given in core courses; and whether teacher grades are based on "progress" or "proficiency," or a combination of these along with factors such as effort and participation. These questions were not easily answered, particularly considering the departmental structures and sense of autonomy in which teachers were operating in their classroom instruction. A key role of the facilitator was to sustain a positive and collaborative dialogue among the teachers and department heads on the school design teams so that the questions did not become threatening to specific teachers. What the school teams started to recognize was that these questions were connected to the more complex issues they faced in their school reform efforts—whether the high school's curriculum, course offerings, and the grading criteria reflected high expectations for all students and were aligned with the standards and proficiencies measured through the external assessments.

HELPING HIGH SCHOOLS PLAN FOR INCOMING FRESHMEN

Several high school teams in one district felt that they never had sufficient data on incoming freshmen. The ninth-grade population for all of the high schools in the district came from several middle schools, and data were not easily available to the high schools on the characteristics of the students, absence levels for the previous year, and previous performance on the state assessments and other standardized measures. Because all of the high schools were planning to create small ninth-grade learning academies, a decision was made to import data for all of the eighth graders into the SOCRATES system. As soon as these students had been assigned to a high school, data profiles were provided to the principal and school design teams.

- One principal's comment that "the data focused our attention on grade 9" captured what happened in all of the high schools. The school teams not only had data on the incoming freshmen, but also had previous data showing trends in student performance as students progressed through high school. For several of the high schools, the data showed very low levels of reading literacy for nearly half of the incoming freshmen. In one high school, this finding was combined with earlier data showing that reading levels actually dropped off during the high school years. This provided the school with the rationale for a teaming approach that emphasized literacy as the cornerstone of the redesign plan for the school. The decision to train and utilize in-school literacy coaches was affirmed. Another high school used data to design a Transition Summer Program for the incoming freshmen.

- Because of the momentum created by the data, the ninth-grade academies that have been created in the high schools for the opening of the 2001-2 school year will receive ongoing data profiles of the progress of their students on multiple measures. As expressed by one high school principal, "Next year within the ninth-grade team structure, there will be planning time to do some analysis of what the data says in terms of what they [academy teams] need to be doing about teaching and learning...all of this is being driven off of some of the data we were given."

CREATING A CULTURE OF DATA USE

As the schools completed their first year of structured data use, there was evidence that staff attitudes about data use were already changing. All of the schools used the data to update school improvement and redesign plans. One principal commented:

> *Before, they [school staff] didn't have any idea of what data were available or how they might disaggregate data to help inform decisions that would improve instruction. Now they do!. . .Not only are we going to use data more, but we have begun to make instructional changes in the school based on the data. We anticipate using it a lot more to continue to support our decision making.*

The work with the school design teams was organized around a collaborative process focused on questions that were important to school staff. This contributed to staff use of the data. As one staff member expressed, "We learned about the potential for asking and answering questions that we never thought of before." Because the facilitation process emphasized inquiry and open discussion, people started to recognize that getting meaningful data was partly a matter of their getting better at asking questions. In one school, there was a feeling that another high school in the district had gathered better data from the SOCRATES system because "they asked better questions...we didn't ask the right questions to get it...we have to get better at asking the right questions and getting the data that we need."

Principals and members of the school design teams also recognized that staff varied in their skills for analyzing and using data. They commented on the future potential of the system if staff skills develop: "Because it is our first year of really trying to get a grip on how do you use data, we haven't really tapped into SOCRATES' potential to provide different types of data to us." One member of a school design team commented on staff needs: "People that you would think would be competent data users, like the math teachers, are not versed in using data.... We need a designated data person on the design team who has time for reflection and to coordinate the use of data." Staff motivation is paramount. As one principal said, "My issue is how do I get other faculty members to at least examine and appreciate the data and then to make teaching and instructional changes...that's the ultimate reason for trying to push the use of data."

7 Making the Transition to Data-Driven High School Reform: Lessons From Research and Practice

The literature on data-driven school improvement and the experiences of the Breaking Ranks high schools described in this paper provide rich insights about what it takes to create a context for data-driven reform and what makes the process work effectively. These lessons are summarized below as essential features of an effective data-driven high school reform process.

Identify Meaningful Questions About Student Performance

The process of questioning, exploring, and searching for new understandings about student performance is essential to creating more effective learning environments for high school students. The first step is to identify meaningful questions. When the dialogue about school reform is driven by important questions about student performance, school staff will ask for more extensive data on factors that affect achievement. The use of data thus becomes an iterative process that leads to deeper analysis and deeper understandings. Identifying a specific area of focus is also important as school teams define their questions about student performance. The focus could be determining literacy achievement gaps for specific groups of students, examining trends in performance as students move through the grades, or exploring how school attendance affects performance for specific groups of students. Clearly focused questions help school teams look beyond test data to examine other pertinent information. The questions provide a lens that guides staff in analyzing what the data show and in identifying the implications for school policies, practices, and programs. When the focus of the data analysis is clearly defined, school teams are far more likely to understand what the data mean for school reform.

Ensure a Positive Focus on Continuous Improvement

The district has to play an active role in creating a data-driven environment that is non-threatening and conveys the message that the primary purpose of data is to help schools improve student learning and achievement. Districts need to create and sustain the most positive context possible for examining and using data, and the concept of continuous improvement needs to be stressed. A history of low student achievement can feel devastating to high school teams and can cause defensiveness, denial, the blaming of students or their families, or the blaming of the middle and elementary schools. Overcoming these

barriers to productive data use requires that the purpose of data-driven accountability be clearly understood by school staff and other constituents as being data-driven improvement.

Establish Information System Capacity to Integrate and Disaggregate Data

Schools today need the information system capacity that will allow them to integrate and disaggregate data and to access a broad range of information for evaluating school and student progress and making program improvements. Data disaggregation is essential to a high school reform process that engages school teams in examining evidence about what is working for students. Disaggegated data that focus on multiple dimensions of student performance provide a wealth of information that promotes informed decision making. This type of data is necessary for examining equity issues. It allows school teams to answer questions about the performance of specific groups of students, the effectiveness of school programs and practices for these students, and factors that affect student success. The data become essential pieces of evidence that allow school staff and other constituents to identify, understand, and solve problems. When data are disaggregated by student groups, problems and successes can more easily be identified, and priorities can be targeted for areas where change and improvement are needed the most. Disaggegated data help school staff re-examine their beliefs and shed misconceptions about student performance. The use of disaggregated data also helps overcome a narrow over-reliance on aggregated standardized test results. Although standardized test results provide important data, they are only a part of the picture. They need to be further disaggregated and examined with other data about student performance and classroom practices to make informed decisions about the school's effectiveness in supporting the success of all students.

Provide Timely Data

Having timely data about students is also an important aspect of a data-driven school reform process. For example, getting timely data to high schools about the characteristics and previous performance of the incoming freshman class can have a powerful influence on the ability of the high school to plan appropriate instruction that will reduce literacy achievement gaps. As high schools make the transition to smaller learning communities, having pertinent information about students as early as possible will help school staff provide the personalized learning opportunities that support student success.

Provide Time and Opportunities for Inquiry and Data-Driven Dialogue

Many writers have noted that school reform is driven by inquiry and that the systematic use of data is at the heart of this inquiry process. Open dialogue about change and improvement is vital to high school reform, and data are the fuel for discussion, new insights, and new findings. Data-use strategies that involve school teams in collaborative inquiry and problem solving can help create conditions that allow equity issues to be addressed and can help identify changes and improvements. Examining data through a process of collaborative inquiry allows everyone who has a stake in student success to look deeply and broadly at the impact of the policies, beliefs, conditions, and practices that influence success. However, this process takes time. In her extensive writings on collaborative inquiry, Love (2000) points out that data-driven dialogue is a process of listening, discussing, and sharing before rushing to decision making. This process requires adequate time to examine assumptions and explore questions before leaping to premature explanations, assumptions, predictions, or solutions. A rush to data-driven decision making can result in poor decisions that are not truly supported by the data, nor widely shared. Providing sufficient time for data-driven dialogue allows school teams not only to make more sound decisions but also to build staff capacity to question assumptions and learn together.

Conclusion

The collaborative use of data can help schools deepen the conversations around reform and identify programs and strategies that work. The use of data in conjunction with teacher experience can contribute to more sound decisions about curriculum, instruction, and assessment. When collaborative inquiry becomes the vehicle for problem solving, better decisions can be made about creating such structures as smaller learning communities and teacher advisories to promote a more personalized focus for students. Properly used, data can make a difference in meeting the needs of every high school student. As today's high schools seek to transform traditional structures into more personalized, engaging, and success-oriented learning environments, data can be a powerful ally in stimulating positive change and improvement.

Other papers in this series on systemic high school reform will focus on:

- *The District's Role in Supporting High School Reform*
- *Standards-Based Learning for ALL—A Collaborative Partnership*
- *Creating Personalized High School Learning Environments*

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